

ABSTRACT

Apparatus (10) for establishing the positions of metal objects in a mixed input stream of both metal and non-metal objects, the apparatus comprising a differential metal-detecting coil (14A) having a first coil portion wound in a first sense and a second coil portion of generally similar shape and size to the first, wound in a second sense opposite to the first sense, and conveying means (11) for moving objects with respect to, and past, the differential metal-detecting coil in a plane and in a direction with unit vector $\hat{\mathbf{a}}$, characterised in that the second coil portion is displaced from the first coil portion by a displacement \mathbf{B} having a component in the plane in a direction with unit vector $\hat{\mathbf{b}}$, wherein $0 < \cos^{-1} \hat{\mathbf{a}} \cdot \hat{\mathbf{b}} < \pi/2$, and in that the apparatus further comprises analysing means for analysing the form of the output voltage of the coil as a function of time to establish the position of said metal objects in a direction $\hat{\mathbf{c}}$ in the plane, where $\hat{\mathbf{c}}$ is defined by $\hat{\mathbf{a}} \cdot \hat{\mathbf{c}} = 0$.